Obligatory Exercise III

An Ngoc Lam

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Question I

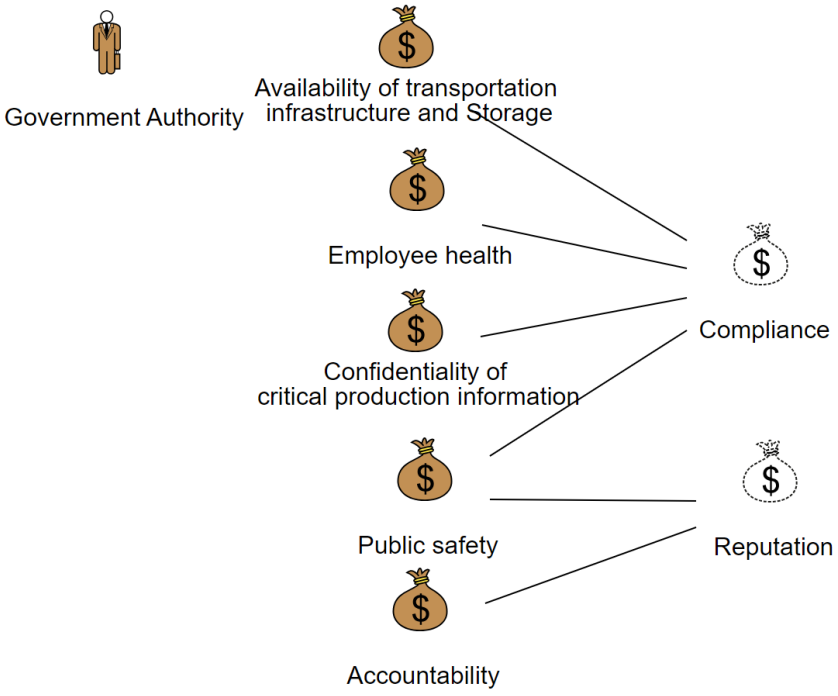

Figure 1: Asset diagram

There are 5 direct assets and 2 indirect assets:

- *Availability of transportation infrastructure and Storage*: regards the accessibility of public transportation such as roads, cars, etc. as well as the warehouse space.
- *Employee health*: regards the health condition of the truck drivers, workers or operators who are involved into the production and transportation.
- *Confidentiality of production information*: regards the critical information of company such as: secret formula, industrial processes, technologies, intelligence property, etc.
- *Public safety*: regards environmental aspects related to measures.
- *Accountability*: regards the integrity and reliability of data used for auditing, diagnostic, etc.
- *Compliance* with regard of laws and regulations.
- *Reputation* related to government, management, etc.

Question II

Consequence	Description
Catastrophic	Catastrophic accidents in large area, causing long-term damage or impossible to recovery.
Major	Serious accidents within multiple municipalities.
Moderate	Incidents with significant damage to people, public properties, or environment within small area.
Minor	Incidents with insignificant damage to people, public properties or environment.
Insignificant	Insignificant incidents in term of noise or littering.

Table 1: Consequence scale for Public safety

Question III

Consequence	Description
Catastrophic	Range of [50%, 100%) of records are affected.
Major	Range of [20%, 50%) of records are affected.
Moderate	Range of [10%, 20%) of records are affected.
Minor	Range of [1%, 10%) of records are affected.
Insignificant	Range of [0%, 1%) of records of the monitoring data, deployment decisions and individual actions are affected.

Table 2: Consequence scale for Accountability

Question IV

Consequence	Description
Catastrophic	Catastrophic accident.
Major	Abrupt manoeuvre required.
Moderate	Recovery from large reduction.
Minor	Increasing workload of transportation or storage.
Insignificant	No hazardous effect on operations.

Table 3: Consequence scale for Availability of transportation infrastructure and storage

Consequence	Description
Catastrophic	Range of [50%, 100%) of the health damage.
Major	Range of [20%, 50%) of the health damage.
Moderate	Range of [10%, 20%) of the health damage.
Minor	Range of [1%, 10%) of the health damage.
Insignificant	Range of [0%, 1%) of the health damage.

Table 4: Consequence scale for Employee health

Consequence	Description
Catastrophic	Causing corruption of the whole chemical production industry, intelligence property violations, or decline in economy growth.
Major	Loss of company secret information such as production formula of the chemicals, optimization parameters, etc.
Moderate	Loss of process or procedure data of monitoring methods, technologies used, etc.
Minor	Loss of monitoring or controlling data
Insignificant	Loss of publicly available data

Table 5: Consequence scale for Confidentiality of production information

Likelihood	Description	Definition
Certain	Five times or more per year	$[25, \infty) : 5y = [5, \infty) : 1y$
Likely	Two to five times per year	$[10, 25) : 5y = [2, 5) : 1y$
Possible	Less than twice per one year	$[2.5, 10) : 5y = [0.5, 2) : 1y$
Unlikely	Less than once per two years	$[1, 2.5) : 5y = [0.2, 0.5) : 1y$
Rare	Less than once per five years	$[0, 1) : 5y = [0, 0.2) : 1y$

Table 6: Likelihood scale

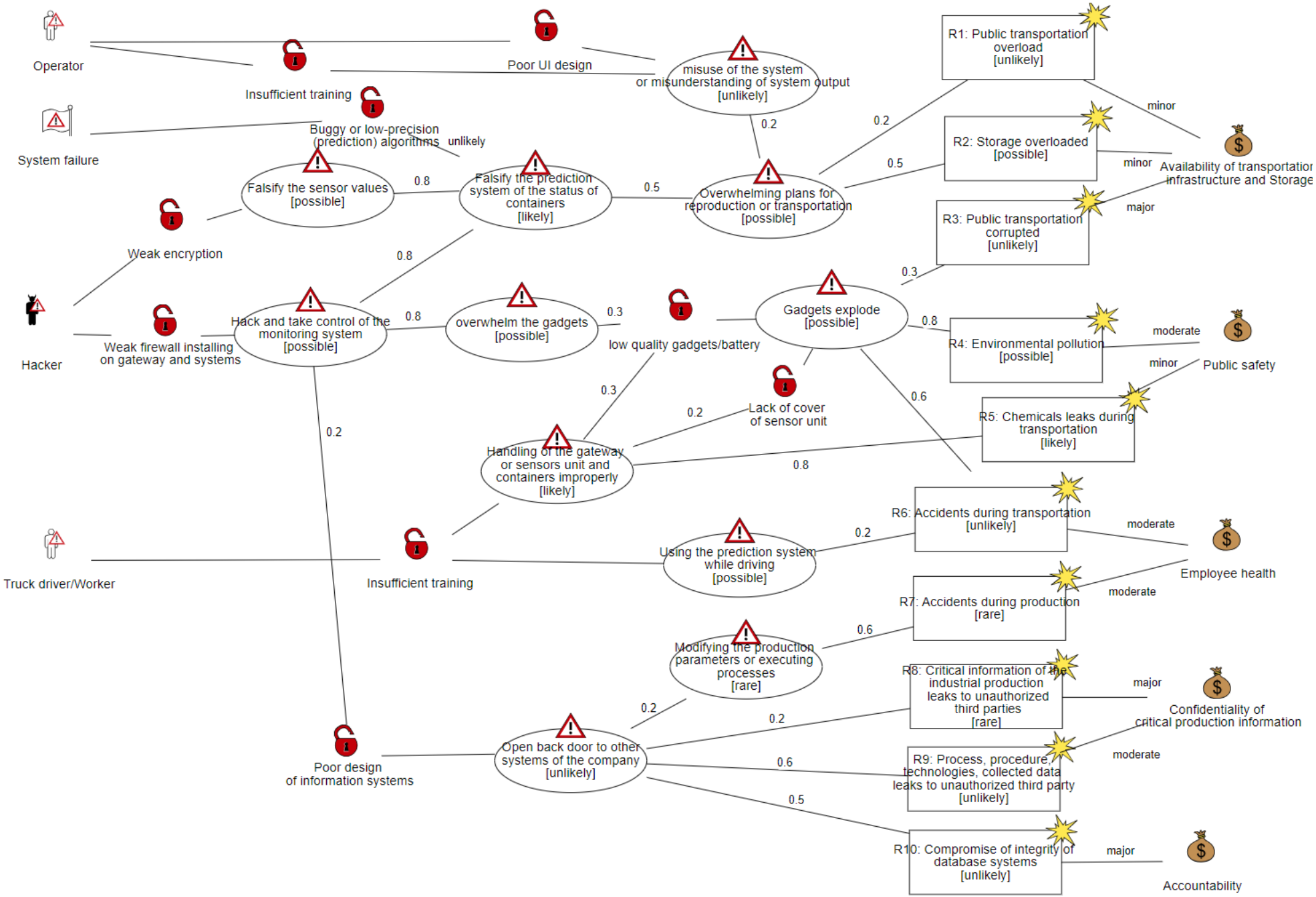

Figure 2: Threat diagram

Question V

Threat diagram in figure 2

Question VI

		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Frequency	Rare			R7	R8	
	Unlikely		R1	R6, R9	R3, R10	
	Possible		R2	R4		
	Likely		R5			
	Certain					

Table 7: Risk matrix

Question VII

Treatment diagram in figure 3

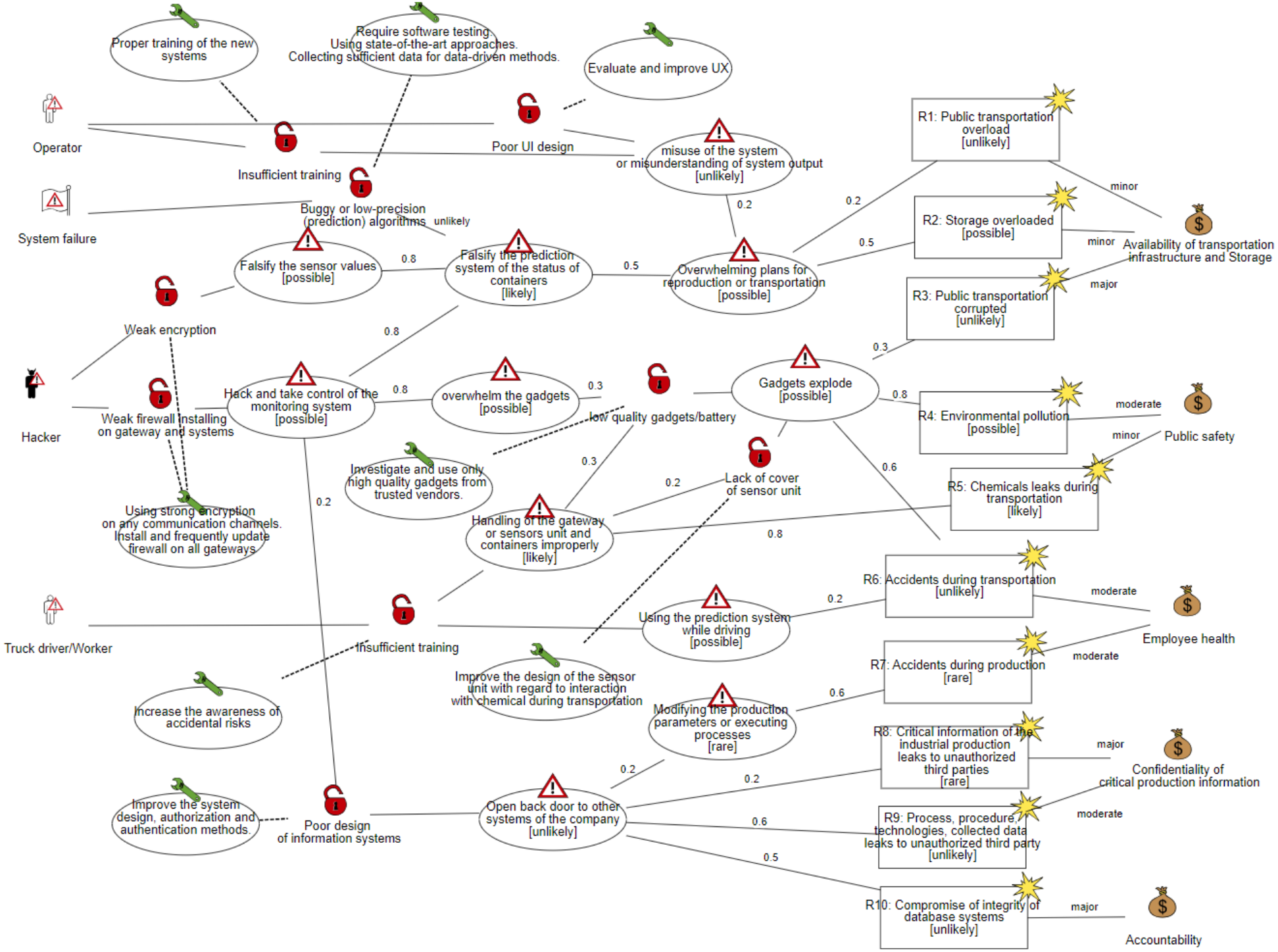

Figure 3: Treatment diagram

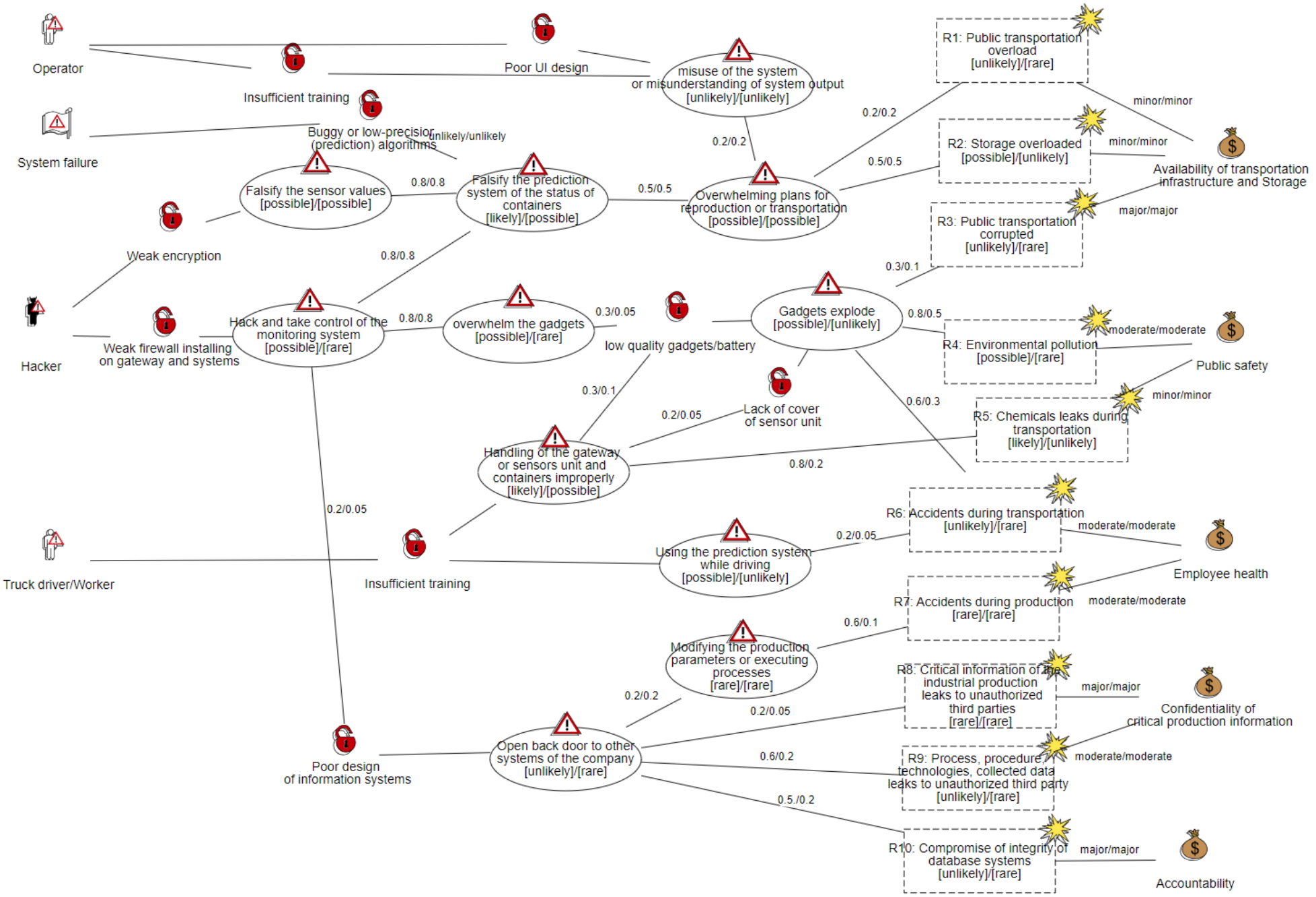

Figure 4: Before-after threat diagram

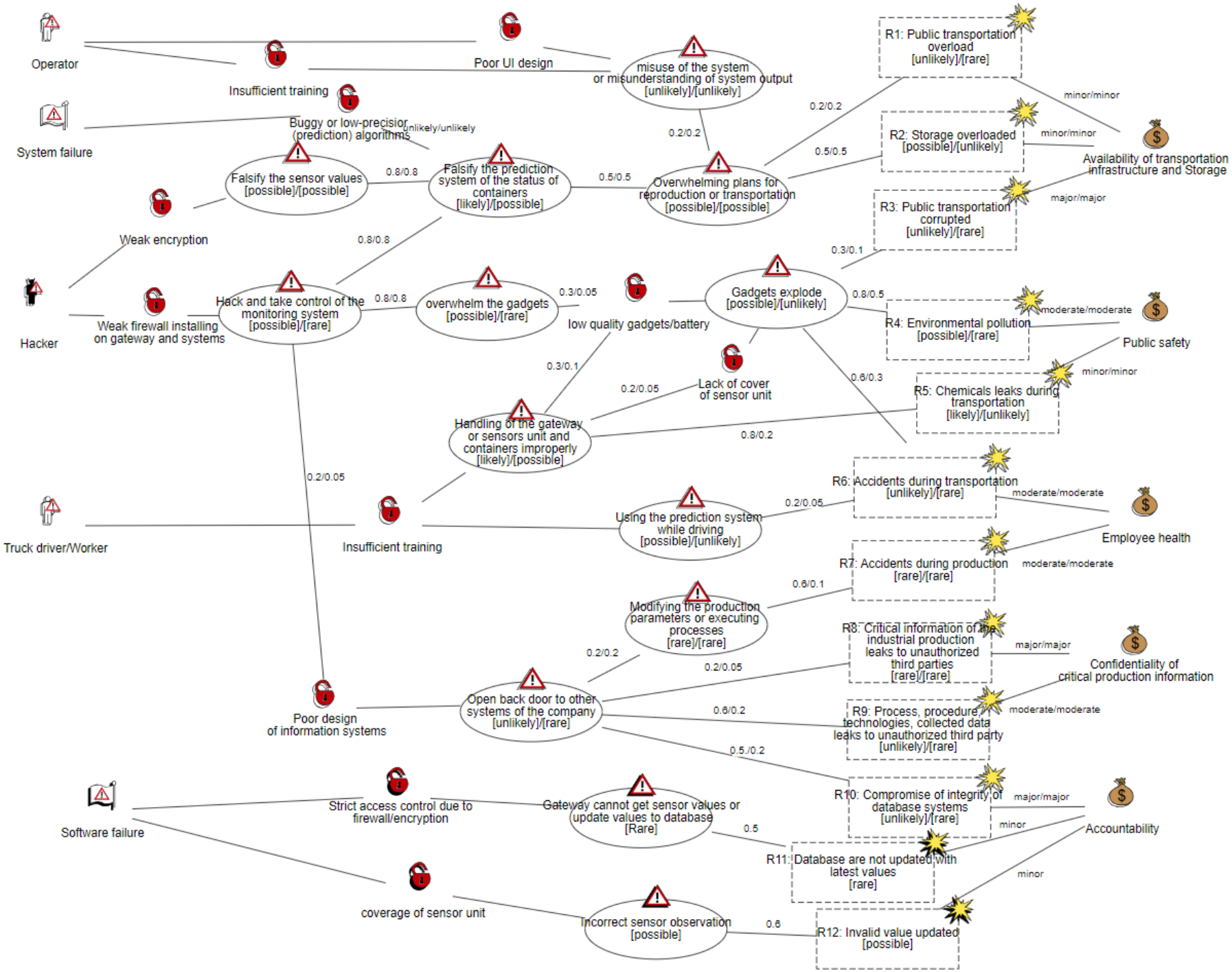

Figure 5: Updated before-after threat diagram

Question VIII

Assume that the treatments for the 3 major risks: R3, R8, R10 are implemented. The resulting before-after threat diagram are illustrated in figure 4

Question IX

Updated before-after threat diagram in figure 5

Question X

		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Frequency	Rare		**R1, R11**	**R4, R6, R7, R9**	**R3, R8, R10**	
	Unlikely		*R1*, **R2**, **R5**	*R6, R9*	*R3, R10*	
	Possible		*R2*, **R12**	*R4*		
	Likely		*R5*			
	Certain					

Table 8: Updated risk matrix